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FOOD SYSTEMS AT RISK

NEW TRENDS AND CHALLENGES





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CHAPTER 5.5

FOOD SAFETY RISKS

Muriel Figuié¹

SUMMARY

Foodborne diseases are responsible for 420,000 deaths each year, one-third of them in Africa. Food safety issues are usually attributed to traditional food systems, but the development of modern food systems in low-income (LI) and lower middle-income (LMI) countries brings with it new risks. The setting of private standards can counterbalance the poor capacity of States to enforce safety regulations, but can also contribute to a dual system that concentrates the flow of unsafe products on the most vulnerable section of the population. Unsafe food not only poses significant public health risks but also contributes to large food losses and insecurity, and creates barriers to trade. Dealing with it requires a multi-sectoral approach.

The heavy burden of food safety

Food safety is a major issue for LI and LMI countries. Unsafe food can be defined as food containing harmful microorganisms (bacteria, viruses, parasites etc.) or harmful amounts or combinations of substances (cyanide, aflatoxin, melamine etc.). It causes diseases ranging from diarrhoea to various cancers. It is a major issue in Africa and more broadly in LI and LMI countries (*cf. Map 12*). According to the WHO (2015), an estimated 91 million people fall ill every year in Africa after eating contaminated food (600 million worldwide), and 137,000 people die (420,000 worldwide). In Africa, this death toll is mostly related to bacterial contamination and mainly affects children under the age of five.

Data is lacking to track the trend of this burden in LI and LMI countries. We have known about some of these risks for decades, such as aflatoxin contamination (26,000 people living south of the Sahara die annually of liver cancer associated with aflatoxin exposure), but remain a major challenge (Unnevehr and Grace, 2013). Most likely, the burden of many of these risks will increase in the future. First, because exposure to food-related risks might rise. Foodborne outbreaks are mainly related to the consumption of animal products and fresh fruit and vegetables, the consumption of which is increasing as part of the dynamics of food transitions in urban settings, and simultaneously supply chains are getting longer. Furthermore, the uncontrolled industrialisation of food systems could increase the number and scale of the risk of contamination with potentially toxic substances (agrochemicals, food additives etc.). Second, vulnerability to foodborne diseases could increase with the development of antimicrobial resistance, whose impact is expected to be greatest in Africa (O'Neil, 2014).

Moreover, as shown with the problem of mycotoxins, unsafe food not only poses significant public health risks, but also contributes to major food losses (and consequently impacts food insecurity) and creates barriers to trade in agricultural commodities.

Managing food safety requires
the involvement of all actors
in the food chain

While a large proportion of this burden is related to general hygiene issues, including at the domestic level, other food system segments also have a large degree of responsibility. Different surveys quoted by Grace (2015) show that in LI and LMI countries a large amount of marketed foods do not meet the standards for common hazards. For example, only 6 percent of pork samples tested in Nagaland state (India) complied with standards.

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Similarly, only 2 percent of meat samples in the city of Ibadan (Nigeria) complied with standards and none of the milk samples in Assam state (India) did so. However, these hazards do not necessarily translate into risk because consumers in LI and LMI countries often use domestic risk mitigation practices that can be sufficient to deal with microbiological risks, such as boiling milk (Roesel *et al.*, 2015). However, with the development of processed foods and consumption outside the home, consumers' mitigation capacities lose efficacy (Bricas, Tchamda and Mouton, 2016) and are not adapted to the new kinds of 'industrial' risks that they have to face (for example, hormone residues in meat). The management of these new risks requires governmental control, oversight and enforcement.

However, public authorities in most LI and LMI countries have little capacity to set up and enforce safety standards. This context encourages the lack of compliance with food standards among stakeholders in food systems. The capacity to implement surveillance of foodborne outbreaks is also limited. As an example, the assessment by the World Organisation for Animal Health (OIE) of the performance of national veterinary services (based on the Performance of Veterinary Services Pathway (PVS) tool) indicates a lack of capacity in enforcing legislation in most LI and LMI².

The lack of efficient public food safety authorities in many LI and LMI countries is an opportunity for the development of private guarantees aimed at high-income populations. These guarantees rely on brands (often in relation with Western imported products) and/or a distributor, such as supermarkets. Market incentives, through export value chains and high-income consumers, contribute to a duality in safety standards. While these private initiatives can contribute to the development of safe supply chains, they may also contribute to a concentration of the flow of unsafe products to the most vulnerable section of the population, one that cannot access high value-added chains and has less access to hygiene and health services. This development signals the difficulty of many LI and LMIC countries in assuming one of the sovereign functions of the State: ensuring the safety of its population.

Improving food safety as a public health issue requires the involvement and coordination of a large range of stakeholders. Commonly, food chain stakeholders are insufficiently trained and organised to contribute to the implementation of the collective action required to improve food safety (for example, the adoption of

good practice guidelines). Consumers' associations are also too weak to protect consumers' rights to safe food and mainly focus their efforts on food prices.

Industrialisation and the lengthening of food chains pose new challenges in a context of weak regulatory authorities

As mentioned above, industrialisation and the lengthening of food chains multiplies the intermediaries and can contribute to an increase in fraud and contamination. For example, fresh milk contamination tends to increase from farms to retail shops, as shown by Yobouet *et al.* (2015) in the Republic of Côte d'Ivoire. The industrialisation of food systems, from production to distribution, brings 'new' risks such as chemical hazards related to the growing and often uncontrolled use of pesticides, veterinary drugs and food additives, whose full impact on public health may only be visible and measured in the long term (Figué *et al.*, 2019). Moreover, industrial food systems generate large amounts of waste and food packaging that contributes to environmental pollution and impacts public health. Additionally, the weak capacity for controlling food safety at the national level in LI and LMI countries encourages imports of low-quality industrialised products from the international market.

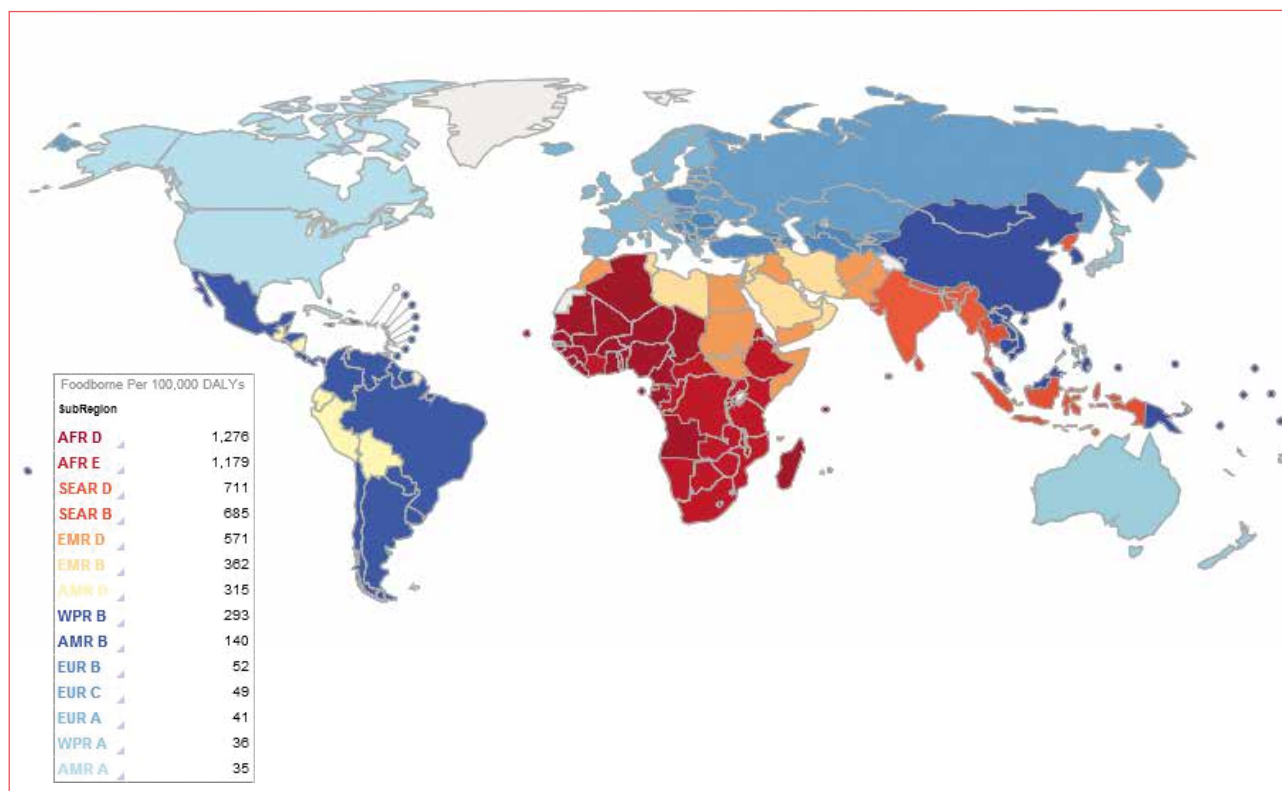
Because of the growing speed and range of food distribution, hazards and their related risks can provoke large-scale outbreaks. For example, in 2018 processed meat from a South African food factory was the source of more than 1,050 illnesses and in excess of 200 deaths, with possible spread in neighbouring countries³.

Large-scale food safety crises can also result in systemic crises, since they generate distrust towards actors in the entire food supply chain and, more broadly, towards authorities, with potentially important political and economic consequences. For example, the 2008 milk scandal in China revealed broad and fraudulent use of a harmful additive, melamine, in the milk industry. The incident was not only a major event in terms of health, with more than 300,000 victims in China, but it also revealed the corruption of many politicians and damaged the reputation of China's food exports.

This background of distrust is a breeding ground for rumours, such as the one related to fake Chinese rice

2. <http://www.oie.int/en/solidarity/pvs-pathway/>

3. <https://www.foodpoisonjournal.com/?s=africa>



Map 12: WHO estimates of the global burden of foodborne diseases.

Source: World Health Organization Map Production: Foodborne Disease Burden Epidemiology Reference Group (FERG), World Health Organization, 2015.

Hazards include diarrheal disease agents and invasive infectious disease agents (viruses, bacteria, protozoa), Helminths (cestodes, nematodes, trematodes), chemicals and toxins (cassava cyanide, dioxin, aflatoxin).

(FAO and WHO, 2018) in Africa. In December 2016, it was reported in the Nigerian media that customs officials had seized 2.5 tonnes of plastic rice. Such 'revelations' continue to make regular headlines even though no instances of 'fake' or 'plastic' rice have been substantiated by national authorities' investigations.

Conclusion

Stakeholders in food chains in many LI and LMI countries face constraints in matching the ongoing transformations in food systems with their associated risks. Most projects to improve food safety focus on supporting high-quality value chains (for example, targeting export markets or high-income consumers) (Alonso, 2019). The development of some specific high-quality and high-value chains may have a ripple effect on the quality of the whole market chain. However, it can also have a competitive effect, concentrating the distribution of poor-quality products to the poorest; the results are highly dependent on the economic context and commodities (Moustier, Anh and Figuié, 2003). But, as health is a public good and food safety

is not only a quality attribute, supporting the capacity of States to ensure the food safety quality of low-cost food available to the poorest must be a priority. Obsolete, ineffective or simply missing food safety standards, combined with a lack of enforcement, are key to this issue. And as value chains need time to adapt, establishing modern food safety standards and their enforcement needs to be done in a gradual and measured way in order to avoid an immediate food security issue. As with other challenging global health issues (for example, transboundary infectious diseases, antimicrobial resistance, environmental contamination etc.), dealing with food safety requires an inclusive and adaptive approach, which is multidisciplinary and trans-sectoral (health, agriculture, environment and trade), as suggested by the One Health approach. ●

BOX 16
FOOD SAFETY AND CONSUMER ANXIETY IN VIETNAM¹

The improvement in agricultural production observed in Vietnam over the past 20 years has relied on an intensification of production, particularly through the increased use of chemical inputs (fertilisers, pesticides etc.). Food processing has also been industrialised, alongside the retail sector (through the development of supermarkets).

Food security has greatly improved but new food safety issues are emerging. The modernisation process in the Vietnamese food system operates in a context where authorities lack the capacity to properly monitor the sector. Checks are scarce and when they exist there is a low level of trust given the frequency of misleading information. Due to the lack of official monitoring and information, the media are the main source of information for consumers.

Indeed, local media regularly reports cases of mass poisoning. Examples of fraud, such as reconstituted powdered milk sold as fresh milk and, more dramatically, imported milk from China adulterated with melamine in 2008, are numerous. Moreover, social media is developing thanks to increased internet access and contributes not only to providing information to consumers

but also acts as an amplifier of crises and contributes to the spread of rumours (for example, artificial eggs from China sold on the markets).

This context contributes to a growing food anxiety among consumers, mainly related to the presence of chemical residues: pesticides in vegetables, hormones in meat, preservatives in processed food etc. The safety of apples has been a recent topic of concern to Vietnamese consumers. In 2012, the media reported that Chinese farmers from Yantai had coated bags for apples with prohibited toxic pesticides (Tuzet and Asomate) and arsenical fungicide. China is the principal source of apple imports in Vietnam and Vietnamese consumption of Chinese apples has been deeply affected by this revelation. Media headlined the issue of 'toxic apples' and 'toxic Chinese fruits'. Despite the problem being localised to one Chinese province, it affected trust in all apples, all fruit and then all products imported from China. This distrust remained even after the announcement that the company which had disseminated the toxic bags had been sanctioned. Consequently, Vietnamese imports of Chinese apples halved between 2009 and 2013.

1. Based on Figuié et al., 2019

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CONCLUSION OF SECTION 5

THE ELUSIVE AND UNSTABLE LINKAGES BETWEEN FOOD CONSUMPTION AND FOOD PRODUCTION

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There is a contrast in food and nutrition security issues between the global and local levels. At a global level, production of most food products has increased faster than population growth and now exceeds the nutritional caloric average requirements. Today, the average consumption of animal products, sugar, fat products and ultra-processed foods are far too high, leading to several global pandemics (obesity, diabetes, cancers etc.) (cf. Chapter 5.4). At the same time, important food shortage threats exist at local levels, especially in Africa, and many new food safety problems have emerged in LI and LMI countries due to the rapid industrialisation of food systems, increasing consumption of animal products and poor regulation capacity (cf. Chapter 5.5).

No single and simple solution exists, and the contributions in this section shed light on the complexity of possible answers, especially with regards to production and marketing.

Solutions based mostly on trade are not desirable since relying on the international market to import food on a regular basis or during specific events will become increasingly risky. On the one hand, increasing climatic shocks, together with erratic national decisions (do not forget the numerous export bans during the 2008 crisis), are likely to make international staple food markets more unstable (cf. Chapter 5.3). On the other, there is a serious possibility that international food price trends will rise compared to their level before the 2008 food price crises (cf. Chapter 5.2).

Instabilities in food supply and food prices are also locally driven. They have serious consequences for poor consumers for whom food accounts for a large share of total household expenditure. To smooth food supplies and reduce price variations, more investments could be steered towards physical investments in LI and LMI countries, such as transport and storage infrastructure, and market regulation policies.

In LI countries, and more specifically in Africa, there is an obvious need to reduce the yield gap and improve the productivity of cropland. But health, natural resources and climate issues mean conventional intensification is questionable. Agroecological intensification is therefore considered as a possible pathway (cf. Chapter 5.1). However, the issue is controversial since the productivity of agroecological agriculture is deemed to be low and may lead to an expansion of cultivated land at the expense of tropical forests (cf. Chapter 5.2).

Technology may contribute to meeting the growing demand in an increasingly risky context if it is able to reduce production sensitivity to natural hazards (climate shocks, pests and diseases), lags in production, and transport and storage costs. Research can help the required technologies to emerge, but a significant level of investment would also be necessary. In both cases, supportive policies will be required.

However, tailoring food supply to meet the needs of a highly diverse and changing demand is only one side of the coin. On the other are public policies, which will need to contribute to driving consumption towards more sustainable and healthy diets.

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